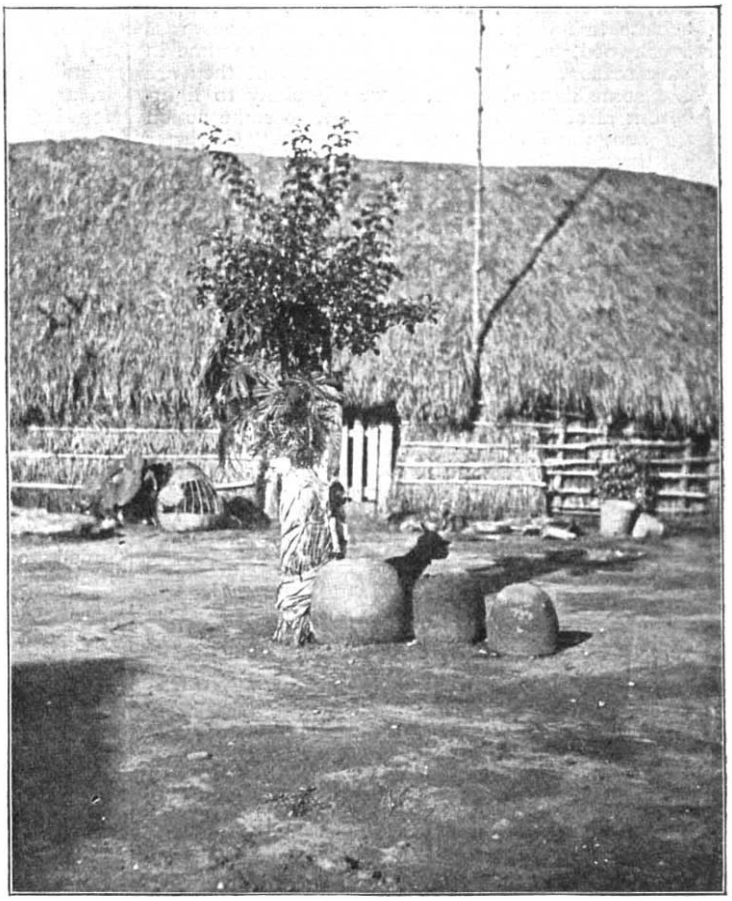
THE ETHNOLOGY OF YORUBA AND BENIN.[1]

ANYTHING which Mr. Dennett writes in connection with the Black man is bound to be of interest and importance to ethnologists; for even if they disagree with his ultimate theories and deductions they are ready to acknowledge the truth, and often the novelty, of the facts and observations he places on record. In many respects the book under review, which deals mainly with the Yoruba people of the western part of southern Nigeria, is superior to any he has as yet written, in that it contains more undoubted facts and accurate observations than deductions which set one's teeth on edge (as in "At the Back of the Black Man's Mind"), because they are based on insufficient evidence or lack of comparative study of other African races or languages. In fact, it may be said at once without too many qualifications that this work of Mr. Dennett on the Yoruba people is a remarkable book of permanent value to the ethnologist and to the student of Africa. It is, indeed, a special insight into the religious ideas of this highly developed negro people, from whom undoubtedly sprang the closely related art and civilisation of Benin, and most of the religious ideas to be found throughout southern Nigeria from Dahome to the Cameroons.

Yorubaland seems to have been invaded at a relatively early date by northern influence coming from Bornu, Hausaland, and the Fula and Songhai countries of the Upper Niger. We know from the interesting researches of Clapperton and Lander that in the early part of the nineteenth century the country of Borgu, which borders Yorubaland on the north, possessed amongst other evidences of northern influence a corrupted version of Christianity of some ancientness, said traditionally to have been brought there by Tuaregs or Berbers from the Sahara Desert. Similar traditions (accompanied by good collateral evidence) derived from Bornu or northern Hausaland most of the old dynasties of Borgu and other countries bordering the Lower Niger. It is, therefore, no difficulty to go a step farther and believe with Prof. von Luschan and other authorities that European influence penetrated far south into the Niger basin and the Cameroons before the times of Islam and the Roman Empire. Von Luschan can indicate in the Ethnographical Museum of Berlin very marked parallels between the art and the religious emblems of the Benue, Lower Niger, and Camerons regions, and those of Crete and ancient Greece. This analogy, again, quite independently, is pointed out by Mr. Talbot in the December number (1910) of the *Geographical Journal* ("The Land of the Ekoi"). Similarly, in reading Mr. Dennett's extraordinarily interesting description of Yoruba religious ceremonials and traditions, one is reminded of those of the Mediterranean peoples two thousand years ago and more. On p. 163 Mr. Dennett gives in Latin the exact text of the erotic songs declaimed by the women at a religious festival, which must have been very similar to the mysteries of Cybele and other similar phallic- and nature-worship manifestations of religion among the Greek and Latin peoples.

All that Mr. Dennett writes on the subject of marriage and totems (beginning on p. 176) is of great interest, and so far as the reviewer's knowledge goes, quite accurate. In connection with this, allusions are made from time to time in the book to the question of polygamy *versus* monogamy, and Dr. E. W. Blyden is quoted in defence of polygamy as being the system best suited to the negro race. With these opinions the reviewer differs. In his own books—especially that which dealt with the researches of George Grenfell on the Congo—he has given evidence to show that there is a greater proportional increase amongst negroes who practise monogamy—namely, cohabit with only one spouse, at any rate ostensibly—than amongst those who avowedly practise polygamy. The very conditions under which polygamy is practised in Africa limit to very few the number of children which each woman produces, nor does it follow necessarily that these few children are any healthier or better brought up than those which are the outcome of a monogamous union. In any case, this is almost indisputable: that the civilised negroes of the New World who profess to be monogamous—and are so, nearly as much as are the white people of the same region—are increasing at a faster rate than the polygamous peoples of Africa; are produc-



Tree planted over Grave which thus becomes sacred. From "Nigerian Studies."

[1] "Nigerian Studies," or the Religious and Political System of the Yoruba. By R. E. Dennett. Pp. xv+235. (London: Macmillan and Co., Ltd., 1910.) Price 8s. 6d. net.

ing children quite as vigorous in physique and much better endowed mentally than the average native of Africa.

An interesting allusion is made in this book to the origin of fire, interesting because the native tradition quoted by Mr. Dennett is in accord with the observations and theories of several African explorers. On p. 216 he quotes the Yoruba legend that before man knew how to make fire, bush fires used nevertheless to occur almost yearly at the end of the dry season "when natural combustion took place." In Africa, at any rate, this was how fire became an agent of man. I have seen myself lightning set fire to a dead tree or to the dry grass near a tree, and thus start a bush fire in the dry season. Bush fires are very detrimental, in reality, to civilised agriculture in Africa. Nevertheless, in regions where the natives appreciate this fact and do not set fire to the grass or brushwood, bush fires occur from time to time in the dry season, and the natives assert that they are due to some natural cause, more especially to lightning, but also, it has been suggested, to some action of the sun, possibly of "a burning-glass" character acting through silica or some other mineral substance which concentrated the rays on to tinder. But lightning frequently starts a fire in Africa—as witness the cathedrals, barracks, hospitals, &c., which are burnt to the ground from this cause. The spread of the bush fire proved to be of enormous benefit to early man, since when he followed behind its ravages he was presented by nature with a variety of cooked or half-cooked beasts, birds, and reptiles. In this way he learnt the charms of cooked food and the usefulness of fire, and no doubt began to count on the annual opportunities offered to him in the dry season for the renewal of his household fire before he learnt to produce a flame artificially.

The chapter dealing with totems (p. 175 *et seq.*) is particularly interesting, and useful information is given on the laws and customs of land tenure.

H. H. JOHNSTON.

HIGH-FREQUENCY GENERATOR FOR WIRELESS TELEGRAPHY.

IT is announced in the daily Press that Dr. Goldschmidt has recently succeeded in sending wireless messages from Berlin to the South-Western frontier of Germany using his new high-frequency alternator to generate the electric oscillations. The production of undamped waves by means of high-frequency alternators has been the aim of numbers of inventors, as it is hoped that by producing a suitable generator it may be possible to avoid the defects of working that are associated with the usual arc and spark methods.

A number of alternators have been built, but owing to various reasons none of them have as yet come into extended use. Their design on the usual lines is very difficult, as even if the rotating parts are made to revolve at the highest speeds permissible from mechanical considerations, the number of poles required to produce the high frequencies necessary for wireless telegraphy is so great as to leave very little room for the windings, and the consequent cramping of the windings and great leakage between the closely spaced poles give rise to considerable drop of voltage when load is put on the machine.

Most of the machines that have been constructed hitherto have been of the inductor type, consisting of fixed windings placed under the influence of rapidly rotating armatures of iron containing a large number of projections or teeth, but the Goldschmidt machine is built on a quite different principle.

It is a phenomenon well known to those who have to work with single-phase alternators that when load is put on such machines the armature reaction causes double-frequency currents to flow in the field winding, and that these double-frequency currents cause triple-frequency currents to flow in the armature winding, and so on. This may be explained by the consideration that a stationary alternating flux can be regarded as being composed of two equal and constant fluxes rotating with equal speeds in opposite directions, the speed of the two fluxes being such that one complete revolution is made by them in the time of one period of the alternating flux.

Applying this to the case of an alternator with stationary alternating-current winding and rotating field system, it will be seen that if the rotating field produces alternating currents of a frequency f in the stator, the component rotating fields produced by the stator currents will rotate at the same speed as the field system, one in the same direction as the field winding, and therefore having no inductive effect on it, and the other in the opposite direction, and therefore inducing a current of a frequency $2f$ in it. A continuation of this process would cause currents of frequencies $2f$, $4f$, $6f$, &c., to appear in the field winding, and currents of frequencies $3f$, $5f$, $7f$, &c., to appear in the stator winding. The production of the higher frequency currents in ordinary alternators is limited by the fact that the amplitudes of the series of harmonics decrease rapidly owing to the great impedance opposed to their flow in the windings, but the triple-frequency harmonic superposed on the fundamental is often sufficiently marked to cause undesirable distortion of the wave-shape of the electromotive force of the machine.

Dr. Goldschmidt has constructed a machine in which the effect referred to is utilised to produce currents of very high frequencies, although the fundamental frequency of the machine is comparatively low. In order to prevent the damping out of the higher harmonics, he connects in parallel with the stator windings a series of capacity-inductance shunts tuned to resonance with the odd multiples of the fundamental frequency of the machine, and in parallel with the field winding a series of such shunts tuned to resonance with the even multiples of the fundamental frequency. Owing to the presence of these shunts the high-frequency currents are able to attain considerable magnitudes, and the electrical energy is reflected backwards and forwards between the stator and rotor of the machine a great number of times, the frequency of the oscillations being increased at each reflection until a frequency corresponding to the free period of the radiating circuit is reached.

In Dr. Goldschmidt's machine, oscillations of 120,000 cycles a second are produced, and the rated output is 12 kilowatts.

Practical experience of working will be necessary before it is possible to say to what extent machines of this type are likely to replace the present oscillation generators, but it seems not unlikely that difficulties will arise in keeping the frequency of the oscillations constant enough to enable clear signals to be received. It would appear that any small variation of the speed of the generator would cause each successive harmonic to depart to an increasing extent from its proper frequency, so that the final frequency reached might be so far removed from its proper value that signals would no longer be able to be received; added to this the amplitudes of the harmonics might be expected to be greatly diminished by the fact that a change of the speed of the machine would put all the capacity-inductance shunts out of tune with the harmonics for which they are adjusted, and a considerable weakening of the signals emitted by the aërial would result.

A. J. MAKOWER.